CLAIMS:

1. A method of encoding a plurality of input signals (l, r) to generate corresponding encoded data (100), the method comprising steps of:

(a) processing the input signals (l, r) to determine first parameters ($\varphi_2$) describing at least one of relative phase difference and temporal difference between the signals (l, r), and applying these first parameters ($\varphi_2$) to process the input signals to generate corresponding intermediate signals;

(b) processing the intermediate signals and/or the input signals (l, r) to determine second parameters describing rotation of the intermediate signals required to generate a dominant signal (m) and a residual signal (s), said dominant signal (m) having a magnitude or energy greater than that of the residual signal (s), and applying these second parameters to process the intermediate signals to generate the dominant (m) and residual (s) signals;

(c) quantizing the first parameters, the second parameters, and encoding at least a part of the dominant signal (m) and the residual signal (s) to generate corresponding quantized data; and

(d) multiplexing the quantized data to generate the encoded data (100).

2. A method according to Claim 1, wherein only a part of the residual signal (s) is included in the encoded data (100).

3. A method according to Claim 2, wherein the encoded data also includes one or more parameters indicative of which parts of the residual signal are included in the encoded data (100).

4. A method according to Claim 1, wherein steps (a) and (b) are implemented by complex rotation with the input signals (l[n],r[n]) represented in the frequency domain (l[k], r[k]).

5. A method according to Claim 4, wherein steps (a) and (b) are performed independently on sub-bands of the input signals (l[n], r[n]).

6. A method according to Claim 5, wherein other sub-bands not encoded by the method are encoded using alternative coping techniques.

7. A method according to Claim 1, wherein, in step (c), said method includes a step of manipulating the residual signal (s) by discarding perceptually non-relevant time-frequency information present in the residual signal (s), said manipulated residual signal (s) contributing to the encoded data (100) and said non-relevant information corresponding to selected portions of a spectro-temporal representation of the input signals (l, r).

8. A method according to Claim 1, wherein the second parameters in step (b) are derived by minimizing the magnitude or energy of the residual signal (s).

9. A method according to Claim 1, wherein the second parameters are represented by way of inter-channel intensity difference parameters and coherence parameters (IID, $\rho$).

10. A method according to Claim 1, wherein the second parameters are represented by way of a rotation angle $\alpha$ and an energy ratio of the dominant (m) and residual (s) signals.

11. A method according to Claim 1, wherein, in steps (c) and (d), the encoded data is arranged in layers of significance, said layers including a base layer conveying the dominant signal (m), a first enhancement layer including first and/or second parameters corresponding to stereo imparting parameters, a second enhancement layer conveying a representation of the residual signal (s).

12. A method according to Claim 11, wherein the second enhancement layer is further subdivided into a first sub-layer for conveying most relevant time-frequency information of the residual signal (s) and a second sub-layer for conveying less relevant time-frequency information of the residual signal (s).

13. An encoder (10; 300; 500) for encoding a plurality of input signals (l, r) to generate corresponding encoded data (100), the encoder comprising:

(a) first processing means (20; 310; 510) for processing the input signals (l, r) to determine first parameters ($\varphi_2$) describing at least one of relative phase difference and temporal difference between the input signals (l, r), the first processing means (20; 310; 510) being operable to apply these first parameters ($\varphi_2$) to process the input signals to generate corresponding intermediate signals;

(b) second processing means (30, 40, 50, 60; 320, 340; 520, 530, 540, 550) for processing the intermediate signals and/or the input signals (l, r) to determine second parameters describing rotation of the intermediate signals required to generate a dominant signal (m) and a residual signal (s), said dominant signal (m) having a magnitude or energy greater than that of the residual signal (s), the second processing means being operable to apply these second parameters to process the intermediate signals to generate the dominant (m) and residual (s) signals;

(c) quantizing means (70; 360; 560) for quantizing the first parameters ($\varphi_2$), the second parameters ($\alpha$; IID, $\rho$), and at least part of the dominant signal (m) and the residual signal (s) to generate corresponding quantized data; and

(d) multiplexing means for multiplexing the quantized data to generate the encoded data (100).

14. An encoder according to Claim 13, including processing means for manipulating the residual signal (s) by discarding perceptually non-relevant time-frequency information present in the residual signal (s), said manipulated residual signal (s) contributing to the encoded data (100) and said perceptually non-relevant information corresponding to selected portions of a spectro-temporal representation of the input signals.

15. An encoder according to Claim 13, wherein the residual signal (s) is manipulated, encoded and multiplexed into the encoded data (100).

16. A method of decoding encoded data (100) to regenerate corresponding representations of a plurality of input signals (l', r'), said input signals (l, r) being previously encoded to generate said encoded data (100), the method comprising steps of:

(a) de-multiplexing the encoded data (100) to generate corresponding quantized data;

(b) processing the quantized data to generate corresponding first parameters ($\varphi_2$),

second parameters ($\alpha$; IID, $\rho$), and at least a dominant signal (m) and a residual signal (s), said dominant signal (m) having a magnitude or energy greater than that of the residual signal (s);

(c) rotating the dominant (m) and residual (s) signals by applying the second parameters ($\alpha$; IID, $\rho$) to generate corresponding intermediate signals; and

(d) processing the intermediate signals by applying the first parameters ($\varphi_2$) to regenerate representations of said input signals (l, r), the first parameters ($\varphi_2$) describing at least one of relative phase difference and temporal difference between the signals (l, r).

17. A method according to Claim 16, including in step (b) a further step of appropriately supplementing missing time-frequency information of the residual signal (s) with a synthetic residual signal derived from the dominant signal (m).

18. A method according to Claim 16, wherein the encoded data includes parameters indicative of which parts of the residual signal (s) are encoded into the encoded data.

19. A method according to Claim 16, wherein the decoder decodes parts of the encoded signal (100) requiring supplementation by detecting empty areas of the encoded signal (100) when represented in a time/frequency plane.

20. A method according to Claim 16, wherein the decoder decodes parts of the encoded signal (100) requiring replacement or supplementation by detecting data parameters indicative of empty areas.

21. A decoder (200; 400; 600) for decoding encoded data (100) to regenerate corresponding representations of a plurality of input signals (l', r'), said input signals (l, r) being previously encoded to generate the encoded data, the decoder (200; 400; 400) comprising:

(a) de-multiplexing means (210; 410; 610) for de-multiplexing the encoded data (100) to generate corresponding quantized data;

(b) first processing means for processing the quantized data to generate corresponding first parameters ($\varphi_2$), second parameters ($\alpha$; IID, $\rho$), and at least a dominant signal (m) and a residual signal (s), said dominant signal (m) having a magnitude or energy

greater than that of the residual signal (s);

(c) second processing means for rotating the dominant (m) and residual (s) signals by applying the second parameters ($\alpha$; IID, $\rho$) to generate corresponding intermediate signals; and

(d) third processing means for processing the intermediate signals by applying the first parameters ($\varphi_2$) to generate corresponding input signals (l, r), the first parameters ($\varphi_2$) describing at least one of relative phase difference and temporal difference between the signals (l, r).

22. A decoder according to Claim 21, wherein the second processing means is operable to generate a supplementary synthetic residual signal derived from the decoded dominant signal (m) (630) for providing information missing from the decoded residual signal (s).

23. A decoder according to Claim 22, wherein the first processing means is operable to determine which parts of the residual signal (s) have been decoded for synthesising missing non-decoded parts of the residual signal for generating substantially the entire residual signal (s).

24. Encoded data (100) generated according to the method of Claim 1, the data being at least one of recorded on a data carrier and communicable via a communication network.

25. Encoded data (100) at least one of recorded on a data carrier and communicable via a communication network, said data (100) comprising a multiplex of quantizing first parameters, quantized second parameters, and quantized data corresponding to at least a part of a dominant signal (m) and a residual signal (s), wherein the dominant signal (m) has a magnitude or energy greater than the residual signal (s), said dominant signal (m) and said residual signal (s) being derivable by rotating intermediate signals according to the second parameters, said intermediate signals being generated by processing a plurality of input signals to compensate for relative phase and/or temporal delays therebetween as described by the first parameters.

26. Software for executing the method of Claim 1 on computing hardware.

27. Software for executing the method of Claim 16 on computing hardware.